Pacific Institute for the Mathematical Sciences

PIMS Distinguished Speakers Series

RENATE SCHEIDLER

Professor, University of Calgary

Mathematics & Statistics and Computer Science

Title: FAKE REAL QUADRATIC ORDERS

ABSTRACT: In an unpublished note from 2014, the renowned computational number theorist Henri Cohen made the surprising observation that localizations of imaginary quadratic orders at a split prime ideal act very much like real quadratic orders. In a nutshell, allowing powers of a fixed prime number as denominators in an imaginary quadratic order causes it to behave like a real quadratic order. Cohen coined the term "fake real quadratic order" for these localizations. This invites the tantalizing question of whether certain well-known conjectures formulated for actual real quadratic orders also hold in fake real quadratic orders. Two such conjectures include the celebrated and widely believed Cohen-Lenstra heuristic which asserts that approximately 75% of all real quadratic orders support unique prime factorization, and the more controversial Ankeny-Artin-Chowla conjecture about fundamental units in real quadratic orders of prime discriminant. Both these conjectures have undergone extensive computational tests.

In this talk, which is aimed at an audience of number theory non-specialists, we present extensive numerical data that speak to these two conjectures in the setting of fake real quadratic orders. This is joint work with my colleague Mike Jacobson and our jointly supervised graduate student Hongyan Wang.

BIO:

Renate Scheidler is a Professor with a dual appointment in the Department of Mathematics and Statistics and the Department of Computer Science at the University of Calgary. Her research interests are in algorithmic number theory and public key cryptography.

Thursday—November 24, 2016

3:05—3:55 pm

UHall D634

*** Sandwiches and cookies ***